Space Weather Forecast

Issued on Sunday, 16 January 2022 at 00:35 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storm intervals Day 1 (16 Jan). Chance of M-class flares (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low with several Common-Class flares over the past 24 hours, the largest at 15/0854 UTC from a region near the NE limb. There are currently 8 sunspot regions on the visible disc, of which the one near the NE limb as already mentioned is the most active at present. The three regions in the northwest quadrant have the most complexity but no significant flare activity. The remaining sunspot groups are relatively small and simple.
There has been a Coronal Mass Ejection (CME) from the northwest of the Sun today, modelling isn't yet complete but it may give a weak glancing blow at Earth.

Solar Wind / Geomagnetic Activity: Solar winds showed a transition into the main part of the fast wind associated with a coronal hole. Wind speeds started at slightly elevated levels, before increasing after 15/1400 UTC to reach elevated levels at 550-600 km/s by the end of the period. Total interplanetary magnetic field strength was at weak to moderate levels, while the north-south component varied moderately. Geomagnetic activity was Quiet to Active, with a G1 interval 15/2100-0000 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring, although a brief very slight enhancement was observed just after 15/0000 UTC.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low to Moderate, with further Common-class flares expected and a chance of Moderate-class flares. Another two regions are expected to rotate on from the far side within the next two days, and this could also increase solar activity.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected, although one CME is expected to pass close to Earth on Day 1 or possibly early on Day 2 (16-17 Jan). The solar wind is expected to be elevated to strong through Day 1, starting to decline from Day 2 onwards. Occasionally Unsettled to Active periods are likely on Day 1, with isolated G1/Minor Storm intervals still possible, and then to a lesser extent through Sunday night into Day 2 due to possible weak CME influences. Geomagnetic activity is then expected to decline to Quiet to Unsettled levels during Day 2.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at predominantly background levels with no solar radiation storms currently expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	40	40	40
Very Active	R3 to R5 X	No	2	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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